

CLAIMS

I claim:

1. A hazardous area warning system for warning personnel of an attendant hazard when they may enter into hazardous areas, said system comprising:

a receiver for receiving a directional signal indicating proximity of a hazard, and including circuitry that indicates a level of received signal in a plurality of different directions;

means for determining whether a received signal indicates an attendant hazard; and

means for transmitting an indication of whether a person wearing said directional receiving means is in a hazardous area.

2. A system as in claim 1, wherein said receiver comprises:

x-axis receiving means directed along a x-axis and receiving a signal from a hazard zone transmitter;

y-axis receiving means directed along a y-axis and receiving a signal from said hazardous zone transmitter;

z-axis receiving means directed along a z-axis and receiving a signal from said hazardous zone transmitter, the x-, y-, and z-axes generally being mutually perpendicular to each other; and

means for combining received signals from said x-axis receiving means, said y-axis receiving means and z-axis receiving means.

3. A system as in claim 2, wherein each of said x-axis receiving means, said y-axis receiving means, and said z-axis receiving means comprises :

an antenna directed along a respective axis;

an amplifier receiving signal from said antenna;

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a filter filtering an output from said amplifier; and
a detector detecting the output of said filter to determine whether a signal is present in said output.

4. A system as in claim 3, wherein said antenna is a ferrite rod wrapped in wire.
5. A system as in claim 3, wherein said determining means comprises a comparator, said comparator determining whether an output of said combining means indicates that said directional receiving means is closer than a first distance to said transmitter.
6. A system as in claim 5, wherein said comparator further determines whether said receiver is closer than a second distance to said transmitter.
7. A system as in claim 6, wherein said determining means further includes a caution output linked to a first output of a decoder, a danger output connected to a second output of said decoder and an encoder connected to said first output and said second output.
8. A system as in claim 7, wherein when said comparator determines said receiver is within said first distance, said comparator places an output signal on said caution output; and when said comparator determines said receiver is within said second distance, said comparator places an output signal on said danger output.
9. A system as in claim 8, wherein said encoder encodes any outputs placed on said caution output and said danger output.

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10. A system as in claim 7, wherein said danger output comprises vibrating means for providing personnel with a tactile indication of danger.
11. A system as in claim 1, further comprising a data link receiver, said data link receiver comprising data receiver means receiving a signal from said transmitting means; decoder means decoding said received signal; driver means driving a plurality of outputs responsive to said decoder means; and indicator means indicating a safety state responsive to said driver means.
12. A system as in claim 11, wherein said indicator means includes a yellow light, a red light and a green light.
13. A system as in claim 12, wherein said yellow light, red light and green light are LEDs and, said indicator means further includes a green status link LED.
14. A system as in claim 13, further comprising means for disabling a system being monitored.
15. A system as in claim 13, further comprising a first data logger logging danger situation occurrences; and a second data logger logging caution condition occurrences.
16. A system as in claim 1, further comprising a warning transmitter, said warning transmitter including an antenna, said antenna being a ferrite rod wrapped in a loop of wire.
17. A system as in claim 16, wherein said warning transmitter further comprises an oscillator driving a resonant frequency; a buffer amplifier

buffering said resonant frequency from said oscillator; and an antenna driver driving said resonant frequency onto said antenna.

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18. A non-directional proximity receiver comprising:
a x-axis receiver having an antenna directed in a first direction;
a y-axis receiver having an antenna directed in a second direction, said second direction being perpendicular to said first direction;
a z-axis receiver having an antenna directed in a third direction, said third direction being perpendicular to the plane of said first direction and said second direction;
an adder combining signals from said x-axis receiver, said y-axis receiver and said z-axis receiver;
a comparator determining whether a received signal indicates an attendant hazard;
an encoder encoding said indication of an attendant hazard; and
a transmitter transmitting said encoded indication.
19. A proximity receiver as in claim 18, wherein each of said x-axis receiver, said y-axis receiver and said z-axis receiver further comprises an amplifier receiving a signal from said antenna; a filter filtering output from said amplifier; and a detector detecting a signal in said filtered output, an output of said detector being an input to said adder.
20. A proximity receiver as in claim 19, wherein each of said x-axis antenna, said y-axis antenna and said z-axis antenna is a wire wrapped around a ferrite rod.
21. A proximity receiver as in claim 20, further comprising a caution indicator connected to a first output of said comparator; and a danger indicator connected to a second output of said comparator.

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22. A proximity receiver as in claim 21, wherein said danger indicator is a motor, vibrations from said motor providing an indication of danger.
 23. A data link receiver comprising a receiver receiving an encoded signal indicating a safety condition; a decoder decoding said received encoded signal; and a plurality of indicators indicating said safety condition.
 24. A data link receiver as in claim 23, wherein said plurality of indicators include a danger zone indicator, a caution indicator and a normal indicator.
 25. A data link receiver as in claim 23, wherein said plurality of indicators are a red light, yellow light and green light.
 26. A data link receiver as in claim 25, wherein said red light, green light and yellow light are LEDs.

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